### AIChE Chicago Section

# March Newsletter

Chicago Section

### www.aiche-chicago.org

March 2014



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### March 10-11, 2014 · University of Illinois at Chicago

### Keynote Speakers:

Dr. Rakesh Agrawal,	Purdue University
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- Dr. James Foster, Archer Daniels Midland Company
- Dr. Hans K. Fauske, Fauske & Associates

For Conference Information and Registration, visit: <u>midwestconference.weebly.com</u>

### AIChE Chicago March Dinner Meeting

### James Foster, ADM

### ADM Development in Food Engineering and the Integrated Biorefinery

March 10, 2014 University of Illinois at Chicago Poster Session: 4:30-6:00 PM Registration: 4:30-6:00 PM Dinner: 6:00-7:00 PM Meeting and Presentation: 7:00-8:30 PM

> Event Information and Registration here: http://www.cvent.com/d/n4qzzp

If you already registered for the conference, the dinner meeting is included in the registration cost—no need to register for both the meeting and the conference!

## **Chair's Corner**

The Midwest Regional Conference is coming up on March 10 and 11, and it gives us all an opportunity to get together and exchange technical information. This is a great opportunity for over 200 chemical engineers and students to interact at UIC. During this conference there will be four session tracks so you will have

to make some decisions pertaining to which session to attend. We also have arranged for excellent keynote speakers to begin the conference on Monday. Take a look the conference website for information about the conference and to review summaries of all the presentations that are included in this conference:

http://midwestconference.weebly.com/ .

For those of you who aren't attending the conference, you can still join us at the dinner at UIC on Monday night and see the presentation by Doctor James Foster, Director of Process Development Research at Archer Daniels Midland Company. He'll be telling us about the corn milling processes, steeping, ethanol fermentation, bioproducts, biodiesel and industrial chemicals production. The Monday dinner is our March monthly meeting. The conference attendees are automatically registered for this, but you need to register separately if you aren't attending the conference. Use this website to see the monthly meeting event summary:

When you get to the summary page, click on **Invitation** and then on the **Yes** at the bottom of that page to register.

http://www.cvent.com/d/n4qzzp

I hope to meet many of you at the Midwest Regional Conference, and then to meet even more of you at the dinner on Monday.

Jerry Wilks Chair



### March Dinner Meeting Information

### ADM Development in Food Engineering and the Integrated Biorefinery

### James Foster

#### Abstract:

The presentation will review some recent projects in food engineering at Archer Daniels Midland Company including increasing fiber in the diet using innovative products such as Fibersol-2® and extruded edible bean powder. There will be a special emphasis on areas chemical engineers have made significant contributions to the products. Additionally there will be a update of the Integrated BioRefinery at ADM. This process breaks down biomass to Cellulose, Hemicellulose and Lignin. These components are converted to Butyl Acrylate and Ethanol.

#### **Biography:**

James Foster is the Director of Process Development Research for the Archer Daniels Midland Company. In this role he is responsible for industrial process development for the company including the corn milling processes including steeping, ethanol fermentation, bioproducts, biodiesel and industrial chemicals production. Foster has numerous publications and 17 patents to his credit and is on the advisory board for the Iowa State University Center for Crops Utilization Research and completed two terms on the board of the University of Illinois Department of Agricultural and Biological Engineering. Education includes a BS in Chemistry and BS in Mathematics from Loyola University, MS and PhD in Chemical Engineering from the University of Illinois. After working for 15 years in the pulp and paper industry, for the last 15 years he has worked for Archer Daniels Midland.

### AIChE Midwest Regional Conference Keynote Speakers

## Chemical Engineering for a Sustainable Energy Future Rakesh Agrawal

### Abstract:

In the long run, it is likely that all the basic human needs will be met by renewable sources like solar energy. However, there are several challenges associated with harness, storage and use of solar energy to meet our daily needs for food, chemicals, heat, electricity and transportation. In a sustainable future, all these usage must coexist. We will first present some results from our energy systems modeling highlighting the synergistic interactions that exist for transportation sector and production of chemicals. This will be followed by a brief discussion and analysis of candidate processes to produce hydrogen from solar energy and our modeling results for energy storage at giga Watt-hour levels. An exciting aspect of producing fuels and chemicals from biomass is learning to produce the array of molecules that we need with minimum process transformation steps and energy use while maximizing biomass carbon recovery. In this aspect, recent advancements at Purdue by a team of chemists, biologists and chemical engineers will be presented. We will show the new pathways and the associated catalysts that have been developed for the production of fuel and chemicals. On the sun to electricity front, we will present highlights of our research on thin film solar cells via nanocrystal ink based route. We will discuss process and technical solutions leading to power conversion efficiencies that are among the highest for Cu(In,Ga)Se2 and Cu2ZnSnSe4 based solar cells by solution based routes. Finally, if the time permits, we will touch upon the continuing advancements made in the traditional fields such as separations that will still play a vital role in the processes slated for any sustainable energy future.

### An Alternative Methodology Addressing United Nations (UN) Classification Type for Self-Reactive Substances

### Hans Fauske

### Abstract:

This paper provides an alternative to UN testing (such as A, C, E, F, etc.) using one easy to perform 10 g ARSST test to produce the necessary information (maximum rate of pressure rise) to determine the packaging Classification Type. This approach is consistent with UN Guidelines which allow other procedures to be used provided that adequate correlation has been obtained with the classification tests on a representative range of substances.



## March 10-11, 2014 · University of Illinois at Chicago

### Keynote Speakers:

- Dr. Rakesh Agrawal, Purdue University
- Dr. James Foster, Archer Daniels Midland Company
- Dr. Hans K. Fauske, Fauske & Associates

### Technical Sessions including:

- Process Safety Culture
- Renewables Research and Pilot Options
- New Problems and Opportunities Facing US Refineries
- Smart Grid Tutorial
- Advances in Reaction Engineering

- Hydraulic Fracturing—Process Overview
- Engineering for Sustainability
- Materials for Biomedical Applications
- Process Safety Qualitative Analysis Development
- Advances in Fluidization
- ... Plus Young Professionals workshops and social!

## PROCESS SAFETY · REFINING · BIO-PROCESSING ·

## ENERGY · PROFESSIONAL DEVELOPMENT ·



midwestconference.weebly.com or www.tinyurl.com/MRC2014

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## THANK YOU to 2014 Midwest Regional Conference Sponsors & Exhibitors



**Process Safety and Reliability Group** 





Providing Insight Onsite







WANGER INSTITUTE FOR SUSTAINABLE ENERGY RESEARCH AT ILLINOIS INSTITUTE OF TECHNOLOGY









## 6<sup>th</sup> Annual Midwest Regional Conference Program

### Monday, March 10, 2014

7:30 AM - 8:30 AM	Continental Breakfast
8:30 AM – 9:30 AM	Morning Keynote Chemical Engineering for a Sustainable Energy Future, Rakesh Agrawal, Winthrop E. Stone Distinguished Professor, Purdue University
10:00 AM – 11:30 AN	1 Technical Sessions - Atomic Layer Deposition for Renewable Energy - Biomolecules and Polymers at Interfaces - New Problems and Opportunities Facing US Refineries - YP Engineering 101
11:30 AM – 1:00 PM	Lunch with Middle/High School Outreach Participants
1:00 PM – 2:30 PM	Technical Sessions - Electrical Energy Production and Conversion - Renewables Research and Pilot Operations - Energy, Sustainability and the Environment - Smart Grid Tutorial - YP Resume Workshop
2:30 PM – 3:00 PM	Networking Break
3:00 PM – 4:30 PM	Technical Sessions - Advances in Reaction Engineering - Biomaterials for Immunological Applications - Analysis of Financial and Ecological Processes - YP Engineering without Borders
4:30 PM – 6:00 PM	Poster Session
6:00 PM – 7:00 PM	Buffet Dinner
7:00 PM – 8:00 PM	<b>Dinner Keynote</b> <i>ADM Developments in Food Engineering and the Integrated Biorefinery</i> <i>James Foster</i> , Director of Process Development Research, Archer Daniels Midland Company

## 6<sup>th</sup> Annual Midwest Regional Conference Program

### Tuesday, March 11, 2014

7:30 AM - 8:30 AM	Continental Breakfast
8:30 AM – 9:30 AM	Morning Keynote An Alternative Methodology Addressing United Nations (UN) Classification Type for Self-Reactive Substances Hans Fauske, Emeritus President and Regent Advisor, Fauske & Associates
10:00 AM – 11:30 AM	<ul> <li>Technical Sessions         <ul> <li>Current Thoughts on Process Safety Culture, Near-misses, and Major Incident Prevention</li> <li>Materials for Biomedical Applications I</li> <li>Advances in Fluidization</li> <li>Undergraduate Chemical Engineering Education, Industrial Needs and Professional Practice Standards</li> </ul> </li> </ul>
11:30 AM – 1:00 PM	Lunch
1:00 PM – 2:30 PM	Technical Sessions - Process Safety Quantitative Analysis Developments - Materials for Biomedical Applications II - Issues in Emerging Energy Technologies I - Engineering for Sustainability - Corn to Chemicals Industrial Complex I - YP Mock Interviews
2:30 PM – 3:00 PM	Networking Break
3:00 PM – 4:30 PM	<ul> <li>Technical Sessions</li> <li>Hydraulic Fracturing – Process Overview and Implementation, Water Management, and Impact on Illinois Economy</li> <li>Engineering Cellular Cardiology</li> <li>Issues in Emerging Energy Technologies II</li> <li>Corn to Chemicals Industrial Complex II</li> <li>YP Resolving Conflict in the Workplace</li> </ul>
6:00 PM – 8:00 PM	Young Professional Networking Social

## **Young Professionals Social**

Come and join your fellow YP's in celebrating a successful conference by relaxing at the YP Social for networking, drinks, and great conversation! Feel free to join us even if you weren't able to make it to the conference!

What: YP Social after the 6<sup>th</sup> Annual Midwest Regional Conference @ UIC When: Tues, March 11, 5:30PM – 8:30PM Where: Morgan's on Maxwell St 1325 S. Halsted St Chicago, IL



Soft Drinks and Appetizers Provided by AIChE Chicago Hosted by AIChE Chicago Young Professionals Committee (YPC)



### Volunteers Needed for Midwest Regional Conference

The Young Professionals Committee will be organizing several developmental sessions during the Midwest Regional Conference (March 10-11, 2014), and we need your help! We are looking for volunteers from the Chicago chapter to help give short mock interviews, review resumes, and to participate on panels for YP sessions. The mock interview and resume review sessions will take place immediately after lunch on both days of the conference (1:00 - 2:30 PM). The YP panel will be in the afternoon on the second day. Participants in the YP panel will discuss working with difficult people and workplace conflict resolution.

The high school outreach program is also in need of volunteers to participate in panels to discuss what it is like to work as a chemical engineer.

As an added incentive, if you volunteer to help with these developmental sessions, you will be able to register for the conference at the speaker's rate. Any member of YPC attending the conference is welcome and encouraged to help with these sessions as well. If you are interested in volunteering or have further questions, please contact Julie Gruhn (julie.gruhn@honeywell.com) or Abigail Jackson (abigail.jackson@tetrapak.com).

For more information on the Midwest Regional Conference and conference registration, please visit:

http://midwestconference.weebly.com/

### YPC Fauske Test Lab Tour

When: Thursday, April 10th 2014 Time: 6:00PM Where: Burr Ridge, IL Cost: Free! RSVP: janet.chu@sensient by Mon, April 8th

Join YPC for a tour of Fauske's new state of the art thermal stability and combustion testing laboratires in Burr Ridge, IL! Fauske performs testing and consulting services for process safety. For more information about Fauske, visit www.fauske.com.

Pizza and soft drinks will be provided.

Please RSVP to Janet, janet.chu@sensient.com by Mon, April 8th.

## **Upcoming AIChE Conferences and Webinars**

March 10-11, 2014	6th Annual Midwest Regional Conference University of Illinois at Chicago
March 16-19, 2014	4th International Conference on Stem Cell Engineering Coronado, CA
March 26, 2014	Has PSI Become a Data Management Nightmare? Webinar 2 PM—3 PM EDT
March 29, 2014	Preparing for PE Examination in Chemical Engineering Webinar 2 PM—3 PM EDT
March 30-April 3, 2014	2014 Spring Meeting and 10th Global Congress on Process Safety New Orleans, LA
April 9, 2014	What Every Young Engineer Should Know About Process Safety Webi- nar 2 PM EDT
April 29-May 1, 2014	Frontiers in Particle Science and Technology Oak Brook, IL
May 9, 2014	Modeling Non-Ideal Reactors and Mixers Webinar 2 PM EDT

## Looking for a Job? Visit the AIChE

## Spring 2014 Online Career Fair

March 25, 2014

1:00 – 4:00 p.m. EDT

### Special student hour: 12:00 – 1:00 p.m. EDT

Whether you're an active job seeker or just at the point where you are willing to explore new opportunities, AIChE is the best source for jobs that are targeted to your career goals and experience. Connect with leading process industry and other employers seeking talent, from entry-level BS engineers to experienced PhDs.



### PROCESS ENGINEERS

URS Corporation is a fully integrated engineering, construction, environmental, and technical services organization with the capabilities to support the full project life cycle – from inception through start-up and operation to decommissioning and closure. We are a publicly-traded company with more than 56,000 employees in 50 countries. Currently we are looking to fill the following requirements in our Chicago Process Engineering group:

### Job Description

Provide detailed design of processes for refineries and chemical plants

Use simulators to develop heat and mass balances

**Develop Piping & Instrumentation Diagrams and Process Flow Diagrams** 

Perform hydraulic network calculations for line sizing starting with Process Flow Diagrams Perform relief valve calculations

Interact with other disciplines, including equipment specialists and instrument engineers

### Minimum Position Requirements

Bachelor's degree in Chemical Engineering Experience in the design of facilities for refineries and chemical plants Knowledge of major processing equipment, including fired heaters, vessels, heat exchangers, pumps, and compressors

Technical aptitude and ability to grasp a general knowledge of multiple disciplines and technologies

All experience levels are desired; new and recent grads are also encouraged to apply US citizenship or permanent residency

To apply, please send resume and cover letter to:

Doug Chidley

**Business Leader** 

URS Chicago Process Engineering

douglas.chidley@urs.com

All applicants must also register on www.bestworkofyourlife.com



CHICAGO SECTION

### Historical Engineering Events in March

<u>March 1, 1864</u>- Rebecca Lee Crumpler became the first African American woman to receive a medical degree and the only to receive a degree at the New England Female Medical College, which closed in 1873.

<u>March 3, 1831</u>–Thomas Jennings became the first African-American to receive a patent for his invention of 'dry-scouring', a process better known today as dry-cleaning. As a free man, he established a local business in New York in which he sold clothing.

<u>March 5, 1991</u> – <u>The 5 millionth patent is issued for a process turning garbage into fuel by</u> Lonnie O. Ingram, a professor of microbiology at the University of Florida; Tyrell Conway, a former post-doctoral student at the university, and Flavio Alterthum, a visiting professor who is now chairman of the microbiology department at the University of Sao Paulo in Brazil.

<u>March 7, 1979</u> - Voyager 1 transmits first images of a ring system around Jupiter. Voyager 1 was launched on September 5, 1977 and it passed Saturn in November 1980. A second spacecraft, the Voyager 2, was launched earlier on August 20, 1977.

<u>March 8, 1775</u> – Priestley discovers oxygen through experiments with mice. Oxygen was independently discovered in the 1770's; the most famous names associated with this discovery are Joseph Priestley, Carl Wilhelm Scheele and Antoine Lavoisier.

<u>March 8th</u> is International Women's Day – "a global day celebrating the economic, political and social achievements of women past, present and future". On March 8th and the weekend before, thousands of events are held throughout the world to celebrate women's achievements and highlight global issues concerning women and girls.

<u>March 9, 1964</u> – First Ford Mustang rolls off assembly line. Ford sold 22,000 of the sporty car on the first day of sales in April 1965. The Mustang was one of the most successful product launches in automotive history with over one million units sold in its first 18 months.

<u>March 13,1970</u> – PDP-11 minicomputer introduced by DEC (Digital Equipment Corporation) and remained in active production until 1996. It was one of the most popular 16-bit minicomputers ever produced.

<u>March 14, 1987</u> – First Pi Day is celebrated. 3/14 (3.14) was chosen by physicist Larry Shaw of the Exploratorium Museum in San Francisco to be celebrated as Pi Day. For more information, browse the Engineering Pathway's educational resources on Pi Day and other irrational numbers.

<u>March 14, 1927</u> – First female engineer in ASCE. Elsie Eaves was the first woman in the US to be elected as a full member to the American Society of Civil Engineers (ASCE).

<u>March 16, 1926</u> – <u>Dr. Robert Hutchings Goddard</u> launched the world's first successful <u>liquid-fuel rocket</u>. Goddard's rocket was a very small contraption connected to tanks with gasoline and liquid oxygen, and sitting atop a frame 10 feet tall. It screeched into the air for a few seconds, reaching an altitude of about 40 feet and crashing down about 200 feet from its launch site.

<u>March 19, 1932</u> – the Sydney Harbour Bridge, Australia, was opened. It is the world's largest steel-arch Bridge. For more information, see the Engineering Pathway's resources on bridge design and construction.

<u>March 22, 1985</u> – The Vienna Convention for the Protection of the Ozone Layer is adopted in response to studies documenting the harm caused to the environment and our own health by ozone-depleting substances. Ozone is a colorless gas, closely related to the oxygen in the air we breathe. <u>March 24, 1959</u> – the maser was patented by Charles Hard Townes (No. 2,879,439), who was a professor at Columbia University. "Maser" is an acronym for "Microwave Amplification by the Stimulated Emission of Radiation ".

<u>March 25, 1954</u> – Production of RCA's first color television sets. RCA based their color television on the 1947 patent application of Alfred Schroeder, for a shadow mask CRT. Their system passed FCC approval in late 1953 and sales of RCA color televisions began on March 25, 1954.

<u>March 27, 1933</u> – Polyethylene is discovered. Polythene is also known as polyethene or polyethylene. It was discovered in 1933 by Reginald Gibson and Eric Fawcett, two scientists working at ICI's research laboratory at Winnington, Northwich, who accidentally discovered the white, waxy solid while attempting to react ethylene with benzaldehyde in an autoclave.

<u>March 30, 1842</u> – Dr. Crawford Long first uses ether as anesthesia to provide his patients with painless surgery. Diethyl ether (C2H5-O-C2H5), also known as ethyl ether or simply ether, is a clear, highly flammable liquid with a sweet, pungent odor.

<u>March 31, 1889</u> – Eiffel Tower opens. The 300m Eiffel Tower was commissioned to commemorate the French Revolution. Amazingly, all of the elements were prepared in Gustav Eiffel's factory located at Levallois-Perret on the outskirts of Paris. There were 18,000 pieces used to construct the Tower.

### Upcoming AIChE Conferences

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March 30-April 3, 2014	2014 Spring Meeting and 10th Global Congress on Process Safety New Orleans, LA
April 29—May 1,	Frontiers in Particle Science & Technology Conference
2014	Oak Brook, IL

## **Upcoming Chicago Local Section Meetings**

March 10-11, 2014	AIChE Midwest Regional Conference, UIC—Chicago, IL
April 9, 2014	Student Poster session, IIT,
May 14, 2014	MWRD Stickney waste water treatment plant Tour

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We are on the web www.aiche-chicago.org

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## We need your help!

How many opportunities can you find to learn project management, delegation and leadership skills for free? Becoming an officer in the Chicago Section of AIChE is such an opportunity. While you're learning new skills, your local network grows. Just about all of us are either undergoing a career change, contemplating a career change, or are wondering if our career will be changed for us. Volunteering with AIChE is a way to add skills and accomplishments to your resume.

aichechicago@gmail.com

http://www.aiche-chicago.org/Section Info/Volunteer

## **Submitting Articles to AIChE Columns**

We welcome email submissions for our monthly newsletter. Commercial announcements are subject to the fee schedule below. News stories, editorials, technical or career related non-commercial contributions are always welcome with no charge. We consider job postings, announcements of for-fee training courses, expositions, conferences as commercial. Categorization of announcements is at the sole discretion of the Chicago AIChE Board of Directors. Chicago AIChE may publicize activities of interest to our members by cooperating professional societies and other non-profits without charge.

Please submit your material to <u>aichechicago@gmail.com</u> with "newsletter article" as a subject line.

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Fees	Per Month	Per Year	Per Month	Per Year	Per Month	Per Year
Advertisements (3X3)	100	450	150	675	N/A	N/A
Half-Page (~7"x 4.5")	280	1260	420	1890	N/A	N/A
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Special Sizing	Contact Publicity Committee aichechicago@gmail.com					

For the purchase of a year ad, customers have the option of changing ads/jobs month to month. Online payment can be done using <u>http://www.cvent.com/d/9cq5pw/4W</u>



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